DOUGLAS A. DUCEY
Governor

MARK W. KILLIAN
Director

Arizona Department of Agriculture

Environmental Services Division
1688 W. Adams Street, Phoenix, Arizona 85007
(602) 542-3578 FAX (602) 542-0466

April 23, 2019

Document Processing Desk (EMEX)
Office of Pesticide Programs (7504P)
U.S. Environmental Protection Agency
Room S-4900, One Potomac Yard
2777 South Crystal Drive
Arlington, Virginia 22202-4501

This is Arizona's second renewal request under the streamlined process for this Section 18, specific exemption, granting the use of sulfoxaflor, Transform WG, EPA Registration # 62719-625, for the control tarnished plant bug in cotton. This use was of great benefit to our growers and greatly appreciated. We request the use exemption be available for use the same dates it was last year, June 1 – October 31.

Recertification: I certify that the requirements as laid out in 40 CFR 166.20(b)(5) including the following exist:
(A) The emergency condition described in the preceding year's application continues to exist;

(B) Except as expressly identified, all information submitted in the preceding year's application is still accurate;

(C) Except as expressly identified, the proposed conditions of use are identical to the conditions of use EPA approved for the preceding year;

(D) Any conditions or limitations on the eligibility for re-certification identified in the preceding year's notice of approval of the emergency exemption have been satisfied;

(E) The applicant is not aware of any alternative chemical or non-chemical practice that may offer a meaningful level of pest control, or has provided documentation that each such known practice does not provide adequate control or is not economically or environmentally feasible.

If you find you need something additional, please let me know and I will get it to you as quickly as possible. Thank you for your help and consideration.

Sincerely,

Jack Peterson
Associate Director, ESD

Cc: (electronically)
Dr. Peter Ellsworth
Dr. Brian Bret, DOW

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File Symbol: 18AZ01

This is Arizona's final report for the Section 18 specific exemption which granted the use of sulfoxaflor, Transform WG, EPA Registration # 62719-625, for the control of the tarnished plant bug in cotton.

This was the second request for Arizona for this specific exemption. We will be requesting use again for 2019 through the streamlined review.

§ 166.32 Reporting and recordkeeping requirements for specific, quarantine, and public health exemptions.

(a) Unexpected adverse effects information. *Any unexpected adverse effects resulting from the use of a pesticide under a specific, quarantine, or public health exemption must be immediately reported to the Agency.*

We received no reports of any, found nothing in our review of the use in the field, through reviewing application records and heard nothing negative from our extension colleagues.

(b) Interim and final reports. *A final report summarizing the results of pesticide use under any specific, quarantine, or public health exemption must be submitted to the Agency within 6 months from the expiration of the exemption unless otherwise specified by the Agency. For quarantine exemptions granted for longer than 1 year, interim reports must be submitted annually. When an application for renewal of the exemption is submitted before the expiration of the exemption or before submission of the final report, an interim report must be submitted with the application. The information in interim and final reports shall include all of the following:*

(1) *Total acreage, amount of commodity or other unit treated and the total quantity of the pesticide used;*

We received applications for 140,574 acres of cotton to potentially be treated. (Not all acres have to be treated.) Based on the attached report from Dr. Peter Ellsworth, approximately 120,250 acres were sprayed with Transform. The corresponding pounds of Transform WG corresponding at the maximum 2.25 ounce product rate per acre is 16,910 pounds. This would be equivalent to 8538 pounds of the AI sulfoxaflor. Dr. Ellsworth indicated the use rate was actually somewhere between 2 and 2.5 ounces per acre.

(2) *A discussion of the effectiveness of the pesticide in dealing with the emergency condition;*

Please see attached report from Dr. Ellsworth.

(3) *A description of any unexpected adverse effects which resulted from use of the pesticide under the exemption;*

N/A

(4) *The results of any monitoring required and/or carried out under the exemption;*

N/A

(5) *A discussion of any enforcement actions taken in connection with the exemption;*

N/A

(6) *Method(s) of disposition of a food crop, if required to be destroyed under an exemption; and*

N/A

(7) *Any other information requested by the Administrator.*

N/A

Sincerely,

Jack Peterson
Associate Director, ESD

Cc: (electronically)
Dr. Peter Ellsworth
Dr. Ayman Mostafa
Dr. Brian Bret, DOW

2018 Section 18 Transform for Lygus Control

University of Arizona Maricopa Agricultural Center
Peter C. Ellsworth, Isadora Bordini & Naomi Pier

Lygus Pest Status & Local Pressure

The Lygus bug remains our number 1 yield-limiting, key pest, which along with our other key pest (*Bemisia* whiteflies) is still targeted and responsible for more than 3/4^{ths} of the sprays made by Arizona cotton growers (Figure 1). Novel Lygus chemical control leads remain quite elusive. Flonicamid (Carbine) and sulfoxaflor (Transform) dominate the marketplace when it comes to chemical control of Lygus. Having been marketed since 2006 and 2012, respectively, concerns remain about the potential for resistance evolution if new active ingredients are not found.

The 2015–2016 seasons were historically low insect pressure years, followed by the "new normal" years of 2017 and 2018, which represent modest insect pressures statewide on average. There is a long-term average of about 2 foliar insecticide sprays for all arthropod pests, of which ca. 1.3 are directed against Lygus on a statewide basis (1.69 in 2018). Lygus is the most common target of sprays made to cotton in Arizona. Lygus pressure on our efficacy trial was higher than the commercial norms of this year, supported by the planting of a late maturing variety in a late planted window and subject to nearby migrations of adults from large acreages of harvested alfalfa. These cultural conditions can lead to equally problematic Lygus control challenges for commercial growers.

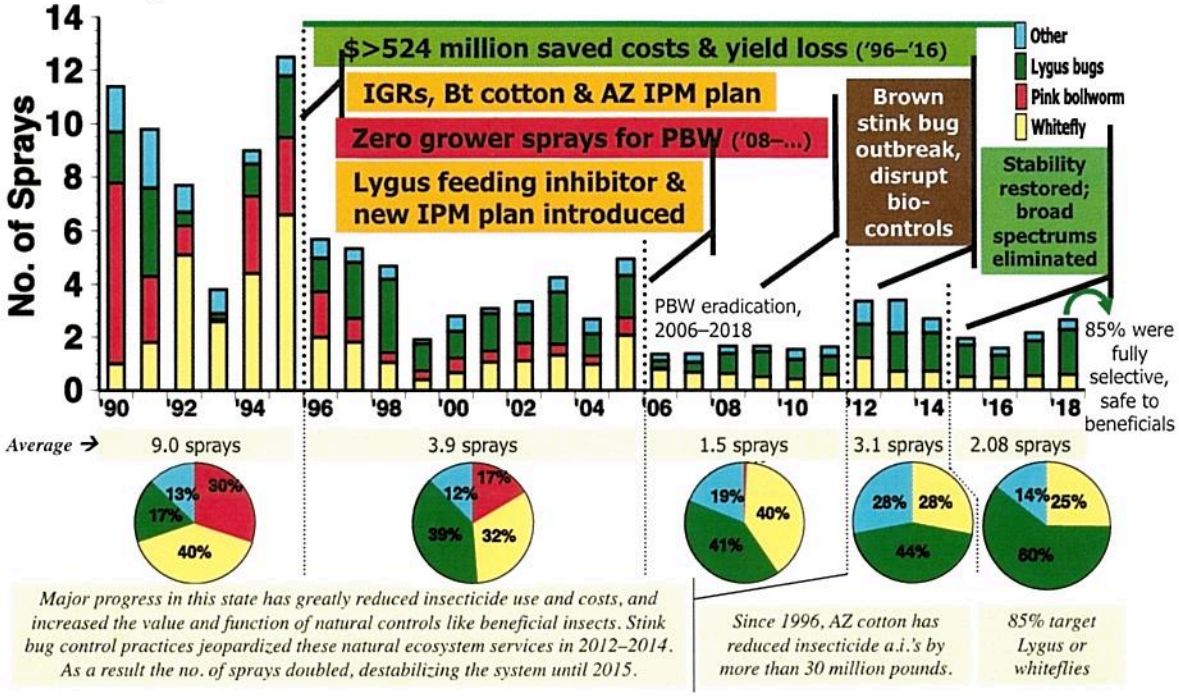

Figure 1. Average number of sprays made statewide by Arizona cotton growers to control insect and other arthropod pests. Lygus and whiteflies are targeted by 85% of the total sprays made against arthropods in Arizona cotton. Lygus is the number one yield-limiting pest. 81% of cotton acres were treated for Lygus. 43% of all Lygus sprays made were with Transform in 2018, which is known to be fully selective and safe to beneficials in the Arizona cotton system. Source: *Cotton Pest Losses Database*, Ellsworth, unpubl.

In the Arizona cotton IPM strategy, selective technologies support conservation biological control that is important in maintaining target and secondary pests at lower, more manageable levels. Prior to 2006, our main control chemicals industry-wide for Lygus were acephate, oxamyl and endosulfan; since then, flonicamid (2006) and sulfoxaflor (2012) have been our fully selective controls for Lygus. **We now have data suggesting areawide lowering of Lygus densities has occurred since the entire cotton arthropod IPM plan has been stabilized through the use of selective technologies (2006–present). Transform is a critical asset in supporting the safe and effective, and selective chemical control of Lygus.**

Transform usage in 2018

In 2018, 96% of cotton acreage was infested with Lygus bugs, with 81% of acres treated for this pest. Where they treated for Lygus, growers made 2.1 sprays for Lygus (or 1.69 times averaged over all acres). About 43% of all Lygus sprays were made with Transform for about 120,250 spray-acres. The number of sprays made against Lygus were higher in 2018 than in 2017, which in turn was higher than the previous 2 years. **This confirms that there remains the emergency condition requiring the use of Transform in Arizona cotton**.

Efficacy remains very good for Transform. There were no reports of control failures or other negative outcomes of Transform use. Pest control advisors continue to report excellent efficacy using Transform for Lygus control, with the most common rates falling between 2 and 2.25 oz per acre.

Efficacy trials were set-up to examine both new and old standards for Lygus control, Carbine and Transform as well as Orthene and Vydate C-LV, either alone, in rotation or in combination with other materials (Table 1; Figure 2).

Table 1. Treatment, product, formulations, and rates for each treatment in the 2018 Lygus Efficacy Trial. Each product was sprayed broadcast 4 times, 2 nozzles per row at 20GPA at about 30 psi with Teejet Twinjet nozzles.

Trt #	Name	Product	Formulation		Rate	lbs ai/gal	Mix in oz/A
1	flonicamid	**Carbine**	50	SG	0.088	0.50	2.8
2	Burkholderia + flonicamid*	**Venerate + Carbine**					32 + 1.7
3	sulfoxaflor	**Transform**	50	WDG	0.0625	0.50	2
4	Burkholderia + sulfoxaflor*	**Venerate + Transform**					32 + 1.5
5	novaluron+acetamiprid fb sulfoxaflor fb flonicamid	**Cormoran fb Transform fb Carbine**	1.5		0.1416	1.51	12
6	sulfoxaflor fb novaluron + acetamiprid fb flonicamid	**Transform fb Cormoran fb Carbine**	50	WDG	0.0625	0.50	2
7	sulfoxaflor fb flonicamid fb novaluron+acetamiprid	**Transform fb Carbine fb Cormoran**	50	WDG	0.0625	0.50	2
8	oxamyl	**Vydate C-LV**	3.77	L	1	3.77	34
9	acephate	**Orthene97**	97	P	1	0.97	16.5
10	UTC	UTC					

*Applied with 0.25% v/v Dyne-Amic; fb, followed by.

Yields (Table 2)

Transform at 2 oz / A (T3) led the trial, once again demonstrating the efficacy of sulfoxaflor against Lygus here. Even at 1.5 oz / A mixed with Venerate, Transform performed statistically similarly to Transform alone at the higher rate. As well, the treatment initiated with Transform and followed by Carbine and then Cormoran (T7) came in 2nd in yield. Vydate C-LV,

an older standard, was nearly the same but in 3rd place. Orthene also performed, coming in 4th and similar to Venerate+Transform and Carbine used alone.

Status of the Standard Lygus Chemical Controls?

On the basis of yields alone, Transform led the trial. Carbine, Orthene97, and Vydate C-LV each demonstrated control of Lygus. While Vydate C-LV did control Lygus, there does not seem to be any compelling reason to make use of broad spectrum Lygus chemical controls (Orthene or Vydate) as long as Carbine and Transform are performing well and support goals in conservation biological control.

Table 2. Treatment number, name, spray pattern, and Lygus and yield results for each treatment in the 2018 Lygus Efficacy Trial. Shaded cells indicate means are significantly different from the UTC by Dunnett's Method ($P < 0.05$). Means not sharing a letter are significantly different from each other by Tukey's HSD ($P < 0.05$).

#	Treatments	24-Aug	31-Aug	14-Sep	18-Sep	27-Sep	No. Sprays	Ave. Nymphs / 100 sweeps		Total Lygus / 100 sweeps		Yield (Seedctn / A)		Yield (Bales/A)	
1	Carbine	•	•	•		•	4	5.1	B	18.7	B	2322	A B	1.52	A B C
2	Venerate + Carbine	•	•		•	•	4	6.6	B	23.1	A B	1942	B	1.22	B C
3	Transform	•	•		•	•	4	5.3	B	16.7	B	2630	A	1.77	A
4	Venerate + Transform	•	•		•	•	4	4.0	B	15.4	B	2399	A B	1.58	A B C
5	Cormoran fb Transform fb Carbine	•	•		•	Co	4	6.1	B	20.0	B	1901	B	1.19	C
6	Transform fb Cormoran fb Carbine	•	•	•		Co	4	5.4	B	17.0	B	2264	A B	1.47	A B C
7	Transform fb Carbine fb Cormoran	•	•		•	Co	4	4.7	B	18.3	B	2563	A	1.70	A B
8	Vydate C-LV	•	•		•	•	4	5.9	B	19.1	B	2571	A	1.71	A
9	Orthene97	•	•	•		•	4	3.9	B	21.6	A B	2460	A B	1.62	A B C
10	UTC						0	17.3	A	32.3	A	909	C	0.52	D

All applications made at 20 GPA, broadcast over the top, with 2 nozzles per row. Co, Cormoran.
=significantly different from the UTC, Dunnett's using transformed seasonal means, $P < 0.05$.
Treatments not sharing a letter for a given variable are considered significantly different from each other (Tukeys HSD, $P < 0.05$)

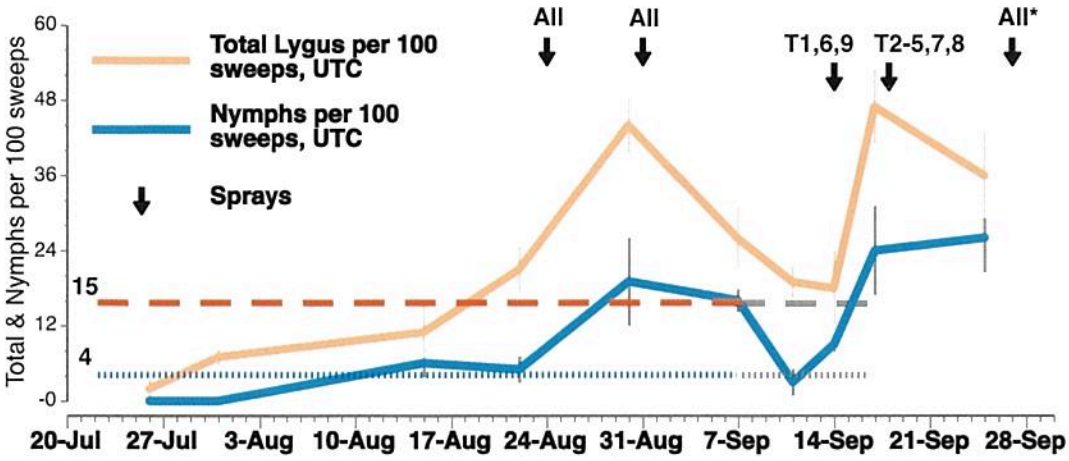

Figure 2. Lygus population trends for the UTC with timing of each treatment indicated. The Arizona threshold is 15 total Lygus with at least 4 nymphs per 100 sweeps. Gray dashed lines indicate rapidly diminishing returns on Lygus chemical controls.